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IMPLEMENTATION PLAN REVIEW FOR SOUTH DAKOTA AS REQUIRED
BY THE ENERGY SUPPLY AND ENVIRONMENTAL COORDINATION ACT

TRW/Environmental Services

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FOR
SOUTH DAKOTA
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AND
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IMPLEMENTATION PLAN REVIEW
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SOUTH DAKOTA
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PREPARED BY THE FOLLOWING TASK FORCE:

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1860 Lincoln Street
Denver, Colorado 80203

Environmental Services of TRW, Inc.
(Contract 68-02-1385)

U. S. Environmental Protection Agency
Office of Air and Waste Management
Office of Air Quality Planning and Standards
Research Triangle Park, North Carolina 27711

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1.0 EXECUTIVE SUMMARY

The enclosed report is the U. S. Environmental Protection Agency's (EPA) response to Section IV of the Energy Supply and Environmental Coordination Act of 1974 (ESECA). Section IV requires EPA to review each State Implementation Plan (SIP) to determine if revisions can be made to control regulations for stationary fuel combustion sources without interfering with the attainment and maintenance of the National Ambient Air Quality Standards (NAAQS). In addition to requiring that EPA report to the State on whether control regulations might be revised, ESECA provides that EPA must approve or disapprove any revised regulations relating to fuel burning stationary sources within three months after they are submitted to EPA by the States. The States may, as in the Clean Air Act of 1970, initiate State Implementation Plan revisions; ESECA does not, however, require States to change any existing plan.

Congress has intended that this report provide the State with information on excessively restrictive control regulations. The intent of ESECA is that SIP's, wherever possible, be revised in the interest of conserving low sulfur fuels or converting sources which burn oil or natural gas to coal. EPA's objective in carrying out the SIP reviews, therefore, has been to try to establish if emissions from combustion sources may be increased. Where an indication can be found that emissions from certain fuel burning sources can be increased and still attain and maintain NAAQS, it may be plausible that fuel resource allocations can be altered for "clean fuel savings" in a manner consistent with both environmental and national energy needs.

In many respects, the ESECA SIP reviews parallel EPA's policy on clean fuels. The Clean Fuels Policy has consisted of reviewing implementation plans with regards to saving low sulfur fuels and, where the primary sulfur dioxide air quality standards were not exceeded, to encourage States to either defer compliance regulations or to revise the SO₂ emission regulations. The States have also been asked to discourage large scale shifts from coal to oil where this could be done without jeopardizing the attainment and maintenance of the NAAQS.

To date, EPA's fuels policy has addressed only those States with the largest clean fuels saving potential. Several of these States have or are currently in the process of revising SO₂ regulations. These States are generally in the Eastern half of the United States. ESECA, however, extends the analysis of potentially over-restrictive regulations to all 55 States and territories. In addition, the current reviews address the attainment and maintenance of all the National Ambient Air Quality Standards.

There are, in general, three predominant reasons for the existence of overly restrictive emission limitations within the State Implementation Plans. These are 1) The use of the example region approach in developing State-wide air quality control strategies; 2) the existence of State Air Quality Standards which are more stringent than NAAQS; and 3) the "hot spots" in only part of an Air Quality Control Region (AQCR) which have been used as the basis for controlling the entire region. Since each of these situations effect many State plans and in some instances conflict with current national energy concerns, a review of the State Implementation Plans is a logical follow-up to EPA's initial appraisal of the SIP's conducted in 1972. At that time SIP's were approved by EPA if they demonstrated the attainment of NAAQS or more stringent state air quality standards. Also, at that time an acceptable method for formulating control strategies was the use of an example region for demonstrating the attainment of the standards.

The example region concept permitted a State to identify the most polluted air quality control region (AQCR) and adopt control regulations which would be adequate to attain the NAAQS in that region. In using an example region, it was assumed that NAAQS would be attained in the other AQCR's of the State if the control regulations were applied to similar sources. The problem with the use of an example region is that it can result in excessive controls, especially in the utilization of clean fuels, for areas of the State where sources would not otherwise contribute to NAAQS violations. For instance, a control strategy based on a particular region or source can result in a regulation requiring 1 percent sulfur oil to be burned state-wide where the use of 3 percent sulfur coal would be adequate to attain NAAQS in some locations.

EPA anticipates that a number of States will use the review findings to assist them in making the decision whether or not to revise portions of their State Implementation Plans. However, it is most important for those States which desire to submit a revised plan to recognize the review's limitations. The findings of this report are by no means conclusive and are neither intended nor adequate to be the sole basis for SIP revisions; they do, however, represent EPA's best judgment and effort in complying with the ESECA requirements. The time and resources which EPA has had to prepare the reports has not permitted the consideration of growth, economics, and control strategy tradeoffs. Also, there has been only limited dispersion modeling data available by which to address individual point source emissions. Where the modeling data for specific sources were found, however, they were used in the analysis.

The data upon which the reports' findings are based is the most currently available to the Federal Government. However, EPA believes that the States possess the best information for developing revised plans. The States have the most up-to-date air quality and emissions data, a better feel for growth, and the fullest understanding for the complex problems facing them in the attainment and maintenance of air quality standards. Therefore, those States desiring to revise a plan are encouraged to verify and, in many instances, expand the modeling and monitoring data supporting EPA's findings. In developing a suitable plan, it is suggested that States select control strategies which place emissions for fuel combustion sources into perspective with all sources of emissions such as smelters or other industrial processes. States are encouraged to consider the overall impact which the potential relaxation of overly restrictive emissions regulations for combustion sources might have on their future control programs. This may include air quality maintenance, prevention of significant deterioration, increased TSP, NO_x , and HC emissions which occur in fuel switching, and other potential air pollution problems such as sulfates.

Although the enclosed analysis has attempted to address the attainment of all the NAAQS, most of the review has focused on total suspended particulate matter (TSP) and sulfur dioxide (SO_2) emissions. This is because stationary fuel combustion sources constitute the greatest source of SO_2 emissions and are a major source of TSP emissions.

Part of each State's review was organized to provide an analysis of the SO₂ and TSP emission tolerances within each of the various AQCR's. The regional emission tolerance estimate is, in many cases, EPA's only measure of the "over-cleaning" accomplished by a SIP. The tolerance assessments have been combined in Appendix B with other regional air quality "indicators" in an attempt to provide an evaluation of a region's candidacy for changing emission limitation regulations. In conjunction with the regional analysis, a summary of the State's fuel combustion sources (power plants, industrial sources, and area sources) has been carried out in Appendix C, D, and E.

FINDINGS

- The South Dakota Implementation Plan has been reviewed for the most frequent causes of over-restrictive emissions limiting regulations. A control strategy was not required for SO₂. A state-wide rather than example region approach was used in developing the control strategy for TSP. South Dakota has more stringent air quality standards than the NAAQS; however, there are no indications that current regulations are overly restrictive in the context of Section IV of ESECA.
- There are indications of TSP problems in three of South Dakota's four AQCR's. A small percent of the TSP emissions come from fuel combustion. The majority come from agriculturally related processes (grain elevators, etc.). An increase in TSP emissions would make attainment of NAAQS more difficult. Therefore, the stationary source fuel combustion particulate emission regulation is not a good candidate for major revision in South Dakota.
- Data available for this report show SO₂ levels below the NAAQS in South Dakota; however, SO₂ emissions from most major fuel combustion sources are also well below regulation allowables. Significant fuel switching could occur within the limits of the present emission regulations. In this context, the present regulation does not appear overly restrictive. The impact on air quality as a result of sources emitting up to regulation limits should be evaluated before further relaxation of the present SO₂ emission regulation is considered.

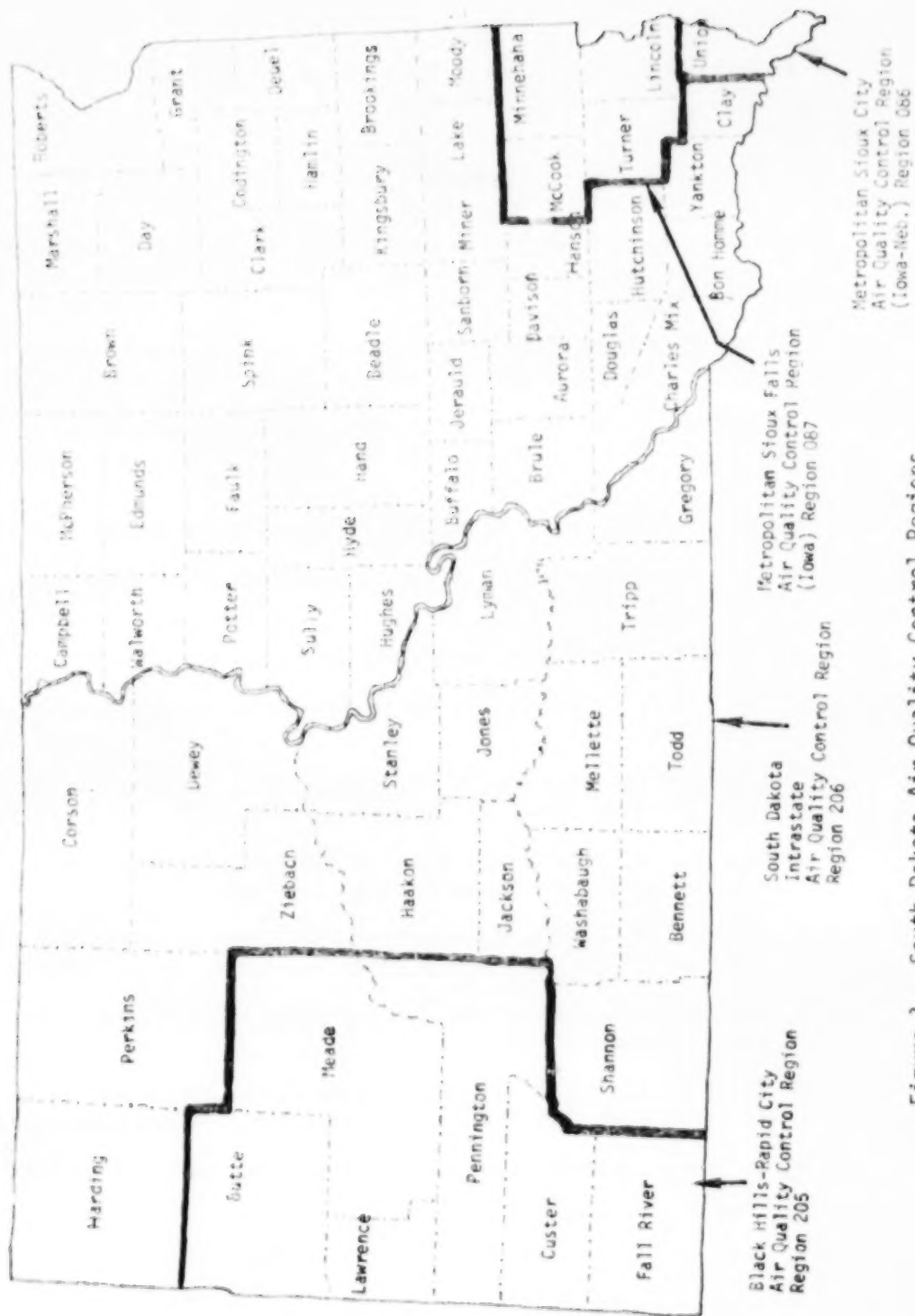


Figure 1. South Dakota Air Quality Control Regions

2.0 STATE IMPLEMENTATION PLAN REVIEW

2.1 Summary

A revision of fuel combustion source emissions regulations will depend on many factors. For example:

- Does the State have air quality standards which are more stringent than NAAQS?
- Does the SIP have emission limiting regulations for control of existing (1) power plants, (2) industrial sources, and (3) area sources?
- Did the State use an example region approach for demonstrating the attainment of NAAQS or more stringent State standards?
- Has the State not initiated action to modify combustion sources emission regulations for fuel savings; i.e., under the Clean Fuels Policy?
- Are there no proposed Air Quality Maintenance Areas?
- Are there indications of a sufficient number of monitoring sites within a region?
- Is there an expected 1975 attainment date for NAAQS?
- Based on reported (1973) Air Quality Data, does air quality meet NAAQS?
- Based on reported (1973) Air Quality Data, are there indications of a tolerance for increasing emissions?
- Are the total emissions from stationary fuel combustion sources lower than those of other sources?
- Do modeling results for specific fuel combustion sources show a potential for a regulation revision?
- Must emission regulations be revised to accomplish significant fuel switching?
- Based on the above indicators, what is the potential for revising fuel combustion source emission limiting regulations?
- Is there a significant Clean Fuels Saving potential in the region?

The following portion of this report is directed at answering these questions. An AQCR's potential for revising regulations increases when there are affirmative responses to the above.

The initial part of the SIP review report, Section 2 and Appendix A, was organized to provide the background and current situation information for the State Implementation Plan. Section 3 and the remaining Appendices provide an AQCR analysis which helps establish the overall potential for revising regulations. Emission tolerance estimates have been combined in Appendix B with other regional air quality "indicators" in an attempt to provide an evaluation of a region's candidacy for revising emission limiting regulations. In conjunction with the regional analysis, a characterization of the State's fuel combustion sources (power plants, industrial sources, and area sources) has been carried out in Appendix C, D, E.

Based on an overall evaluation of EPA's current information, AQCR's have been classified as good, marginal, or poor candidates for regulation revisions. The following table summarizes the State Implementation Plan Review. The remaining portion of the report support this summary with explanations.

2.2 AIR QUALITY SETTING - STATE OF SOUTH DAKOTA

The state of South Dakota was divided into four air quality control regions - AQCR. They are as follows:

- 86 Metro Sioux City interstate air quality control region
- 87 Metro Sioux Falls interstate air quality control region
- 205 Black Hills - Rapid City intrastate air quality control region
- 206 South Dakota intrastate air quality control region.

See Figure A-1.

A summary of the Federal and South Dakota air quality standards for the pollutants under study is presented in Table A-3. The South Dakota standards for particulates are the Federal secondary standards. The South Dakota air quality standards for SO_2 are more stringent than the Federal SO_2 standard. South Dakota has adopted the national NO_2 standards; in addition, a 24-hour NO_2 standard has been added.

SOUTH DAKOTA IMPLEMENTATION PLAN REVIEW SUMMARY

"INDICATIONS"	State		Sioux City		Sioux Falls		Black Hills Rapid City		South Dakota	
	TSP	SO ₂	TSP	SO ₂	TSP	SO ₂	TSP	SO ₂	TSP	SO ₂
• Does the State have air quality standards which are more stringent than NAAQS?	Yes	Yes								
• Does the SIP have emission limiting regulations for control of existing:										
1) Power plants	Yes	Yes								
2) Industrial sources	Yes	Yes								
3) Area sources	No	No								
• Did the State use an example region approach for demonstrating the attainment of NAAQS or more stringent State standards?	Yes	No								
• Has the State not initiated action to modify combustion source emission regulations for fuel savings; i.e., under the Clean Fuels Policy?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
• Are there <u>no</u> proposed Air Quality Maintenance Areas?	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
• Are there indications of a sufficient number of monitoring sites within a region?			No	No	Yes	No	Yes	Yes	Yes	No
• Is there an expected 1975 attainment date for NAAQS?			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
• Based on reported (1973) Air Quality Data, does air quality meet NAAQS?			N/A	Yes	No	Yes	No	Yes	No	N/A
• Based on reported (1973) Air Quality Data, are there indications of a tolerance for increasing emissions?			No	Yes	No	Yes	No	Yes	Yes	N/A
• Are the total emissions from stationary fuel combustion sources lower than those of other sources?			Yes	Yes	Yes	No	Yes	Yes	Yes	No
• Do modeling results for specific fuel combustion sources show a potential for a regulation revision?			N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
• Must emission regulations be revised to accomplish significant fuel switching?			Yes	No	Yes	No	Yes	No	Yes	No
• Based on the above indicators, what is the potential for revising fuel combustion source emission limiting regulations?			poor	marginal	poor	Good	poor	Good	marginal	marginal
• Is there a significant Clean Fuels Saving potential in the region?			No		No		No		No	

The South Dakota monitoring network for suspended particulate matter consists of nine stations. There are no monitoring sites in the South Dakota portion of the Metro Sioux City air quality control region. In the remaining three AQCR's, there are four stations in the South Dakota portion of Metro Sioux Falls air quality control region, three stations in the Black Hills - Rapid City AQCR, and two stations in the South Dakota AQCR. Ambient monitoring of SO_2 is limited within the state of South Dakota. According to the most recent SAROAD data in the National Data Bank, South Dakota has three monitoring sites in the state. The Metro Sioux City AQCR, Metro Sioux Falls AQCR, and Black Hills - Rapid City AQCR each have one monitoring site, while the South Dakota AQCR currently has no monitoring sites in operation.

Summaries for South Dakota air quality status in 1973 are presented in Table A-4 for particulates and A-5 for SO_2 . The number of stations exceeding standards are presented by air quality control regions (AQCR). The highest particulate readings in the state are in the Black Hills - Rapid City AQCR. All of the South Dakota AQCR's violated state standards for particulate in 1973. Based on existing monitoring, South Dakota met all standards for SO_2 in 1973.

South Dakota has one priority II AQCR for TSP. That is the Metro Sioux Falls interstate AQCR (87). The remainder of the state is classified priority III for all pollutants. At the time of submission of the South Dakota State Implementation Plan, the State was able to demonstrate attainment of the secondary standards by 1975. The technical support documentation to aid in the designation of Air Quality Maintenance Areas indicates that a portion of the Sioux Falls AQCR may not attain the state particulate standards in 1975 as was previously projected in the SIP. A revision of the State Implementation Plan is currently being considered.

2.3 BACKGROUND OF THE DEVELOPMENT OF THE CURRENT STATE IMPLEMENTATION PLAN

The State Implementation Plan control strategies and regulations were based on a state-wide approach. Demonstration of the attainment of the particulate standards was necessary only for the Metro Sioux Falls AQCR which was classified priority II. The control strategies and regulations

as submitted by the state were adequate to attain the national standards for particulate matter in the Sioux Falls AQCR. State-wide application of the control strategies and regulations in the State Implementation Plan were designed to prevent further deterioration of air quality in the remainder of the state of South Dakota.

The state regulation for the control of particulate matter from fuel combustion sources limits particulate emissions to 0.30 pounds per million Btu of heat input. This regulation applies to new, existing, and modified sources. The state regulation for the control SO_2 from fuel combustion sources limits SO_2 emissions to 3.0 pounds of sulfur dioxide per million Btu of heat input. This regulation is applicable to new, existing, and modified sources in the state of South Dakota. NO_2 emissions from fuel combustion sources are divided between gas-fired and oil-fired equipment. NO_2 emissions from gas-fired equipment shall not exceed 0.2 pounds per million Btu of heat input, while NO_2 emissions from oil-fired equipment shall not exceed 0.3 pounds per million Btu of heat input. These regulations are applicable to new, existing, or modified sources in the state of South Dakota. Per the June 8, 1973 Federal Register, South Dakota has the option to relax or rescind the NO_x regulations for all priority III AQCR's.

2.4 SPECIAL CONSIDERATIONS - SOUTH DAKOTA

Minnehaha County within the Sioux Falls AQCR has been proposed for designation as an Air Quality Maintenance Area. It is anticipated that special requirements for this area will be developed by this state and submitted to EPA as a modification to the State Implementation Plan.

South Dakota State Legislature exempted the Mobridge Power Plant from compliance with the particulate emission regulations in the State Implementation Plan. EPA has two high-volume samplers for particulate matter in operation in the area to determine if ambient standards are being violated. If ambient standards are being violated, EPA will take enforcement action; if not, the SIP will be revised.

ENERGY SUPPLY POTENTIAL

South Dakota has vast deposits of lignite. Lignite is a low grade brownish-black coal that has high sulfur and ash characteristics. Long

term projections for energy development in the State of South Dakota include the construction of coal gasification plants using the available lignite as the fuel source.

3.0 CURRENT ASSESSMENT BASED ON SIP REVIEWS

3.1 REGIONAL AIR QUALITY ASSESSMENTS

Tables A-7 and A-8 present the emission summaries for South Dakota. They indicate a small fraction (10%) of total suspended particulates come from fuel combustion sources. The majority of particulate emissions come from agriculturally related sources. Fuel combustion sources are the major contributors to total SO_2 emissions on a state-wide basis (approximately 62%).

Tables A-9 and A-10 present the results of estimating what the South Dakota emissions would be on a region wide basis. The largest drawback for using the approach lies in the large geographical dispersion of the emission sources in the South Dakota AQCR's. The analysis is intended to give an "indication" of potential areas for relaxation.

Tables B-1 and B-2 summarize the general data for each pollutant by AQCR that must be considered when estimating the potential for regulation relaxation. The analysis was performed to determine if there were any obvious combustion source candidates. There is no indication from available data that regulations are too stringent for suspended particulate emissions; however, air quality data indicates a tolerance for increased SO_2 emissions.

3.2 POWER PLANT ASSESSMENTS

At the present time, there are nine power plant sites in the state of South Dakota. Two of the power plants use internal combustion reciprocating engines or turbines for power generation. The remaining seven power plants are candidates for additional analysis. A distribution of power plants by AQCR can be found in Table A-6

Two power plants in the state of South Dakota are 100% coal-fired, the first is the Ben French Power Plant in the Black Hills - Rapid City AQCR. The other is the Modridge Power Plant located in the South Dakota AQCR. The Pathfinder Power Plant located in the Sioux Falls AQCR is an oil- or gas-fired power plant, with the remaining power plants in the state of South Dakota being coal-fired with a combination of oil or gas as combustion fuel. Table C-1 presents relevant data on all power plants presently in operation in South Dakota. All power plants are in compliance

schedules to meet emission regulations, with the exception of the Mobridge Power Plant that has been previously identified as having a legislative exemption.

Table C-2 lists the only known projected power plant (1974 through 1985). This is a coal-fired power plant that is scheduled to go on line in late 1975.

3.3 INDUSTRIAL/COMMERCIAL/INSTITUTIONAL SOURCE ASSESSMENTS

All major stationary fuel combustion sources in the state of South Dakota were reviewed (15). Two of those sources presently use 100% coal, one of those sources uses 100% wood. The remaining stationary sources use a combination of oil, gas or coal.

3.4 AREA SOURCE ASSESSMENT

The State of South Dakota was found to have no area sources which could be evaluated within the context of Section 4 of ESECA.

3.5 IMPACT OF FUEL SWITCHING

An analysis of fuel combustion sources was made to determine the feasibility of conversion of coal or oil and its resulting impacts on emissions and regulations. The percentage of coal or oil utilized was estimated by translating all fuel used into total annual heat input and directly proportioning on the basis of the percent of annual heat input contributed by each fuel type. The emissions resulting from conversion to coal or oil at these combustion sources were estimated and compared to current emissions. Table F-1 identifies the emissions resulting from a fuel switch for power plants with a dual fuel capability. Table F-2 identifies the emissions resulting from a fuel switch for major industrial sources with a dual fuel capability.

Tables F-1 and F-2 illustrate the total present and potential emissions based on fuel conversion to 100% coal or oil with present control equipment. All coal-natural gas fired power plants would not meet current particulate and SO₂ emission regulations without additional controls if a switch to burning only coal is made. The Pathfinder Power Plant in the Sioux Falls AQCR could switch from a combination of gas and oil fuel mixture to 100% oil without violating any emission regulations.

All the major industrial sources with a dual fuel capability could switch to 100% oil utilization and meet SO₂ emission standards. It should be noted that South Dakota does not have particulate emission regulations for oil or natural gas burning installations. In general, the analysis indicated that for total suspended particulates, increases in projected emissions with fuel conversion from power plants would be significant. Attainment of ambient air quality standards for particulate will continue to be a problem for South Dakota.

APPENDIX A

- State implementation plan information
- Current air quality information
- Current emissions information

Tables in this appendix summarize original and modified state implementation plan information, including original priority classifications, attainment dates, ambient air quality standards, and fuel combustion emission regulations. SAROAD data for SO_2 and TSP monitoring stations are shown for AQCRs in the state. NEDS emissions data by AQCR¹ are tabulated and broken down into fuel burning categories.

Tables A-9 and A-10 show a comparison of emission inventories in the original SIP and those from the NEDS. An emission tolerance, or emission tonnage which might be allowed in the AQCR and still not violate national secondary ambient air quality standards, is shown for SO_2 and particulates. The intent of this calculation is to indicate possible candidate regions for fuel switching. Tolerance was based on either the degree of control expected by the SIP or upon air quality/emission relationships which are calculated from more recent data. The value of the emission tolerance provides an indication of the degree of potential an AQCR possesses for fuel revisions and regulation relaxation.

Methodology for Increased Emissions tolerance

A tolerance for increased emissions was determined as follows. First, an "allowable emissions" was calculated for each AQCR based on the current NEDS data and the percent reduction (or increase) required to meet the national secondary ambient air quality standards in that AQCR (Worst case from Tables A-4 and A-5). This "allowable" was then compared to that from the SIP. If reasonable agreement occurred, then the "estimated emissions" which would result after implementation of the SIP in that AQCR were used to calculate an emissions tolerance. Thus, some credit could be given to an AQCR which might be restricting emissions more than required by ambient air quality standards. For instance, emission controls applied to AQCRs

¹"1972 National Emissions Report," EPA - 450/2-74-012, June 1974.

other than the example region for the state may reduce emissions well below "allowables." In the event that no data existed or was available from the SIP for an AQCR, the current air quality was used to assign emissions tolerance based on proportional rollback or rollup. Current air quality was also the criteria, if emissions data from SIP and NEDS did not appear to be comparable (this is often the case).

When no SIP emissions data was available, and current air quality levels were less than one half of the level represented by an ambient air quality standard, no "rollup" emissions tolerance was calculated in Tables A-9 and A-10. This arbitrary cutoff point was chosen so as not to distort the emissions tolerance for an area. At low levels of a pollutant, the relationship between emissions and air quality is probably not linear. Although this cutoff may leave some AQCRs with no quantifiable emissions tolerance, it was felt that no number at all would be preferable to a bad or misleading number.

It is emphasized that emissions tolerance is a region-wide calculation. This tolerance obviously makes more sense in, say, an urban AQCR with many closely spaced emissions sources than in a largely rural AQCR with geographically dispersed emissions.

Table A-1. South Dakota AQCR Priority Classification and AQWAs

AQCR	Fed. #	Part. ^a SO _x ^b NO _x ^c		Demographic Information		AQWA Designations ^d		
		SO _x	NO _x	Population 1970	Square Miles	TSP Counties	SO _x Counties	NO _x Counties
Metro Sioux City ^e	086	III	III	178150	3207	53.6		
South Dakota portion				3463	452	21.3	none	none
Metro Sioux Falls	087	II	III	261510	5740	45.6		
South Dakota portion				124086	2576	48.2	(1) Minnehaha	none
Black Hills - Rapid City	205	III	III	113650	12594	9.04	none	none
South Dakota	206	III	III	666257	75955 *	8.8	none	none

Criteria based on Maximum Measured (or Estimated) Pollution Concentration in Area

Priority	I			II		III	
	Greater than	From - To	Less than	From - To	Less than	From - To	Less than
^a Particulate matter: Annual geometric mean... 24-hour maximum.....	95 325	60 - 90 150 - 325	60 150				
^b Sulfur oxide: Annual arithmetic mean... 24-hour maximum.....	100 455	60 - 100 260 - 455	60 260				
^c Nitrogen dioxide	110		110				

^dFederal Register, August 1974, SMSA's showing potential for NAAQS violations due to growth

^eInterstate

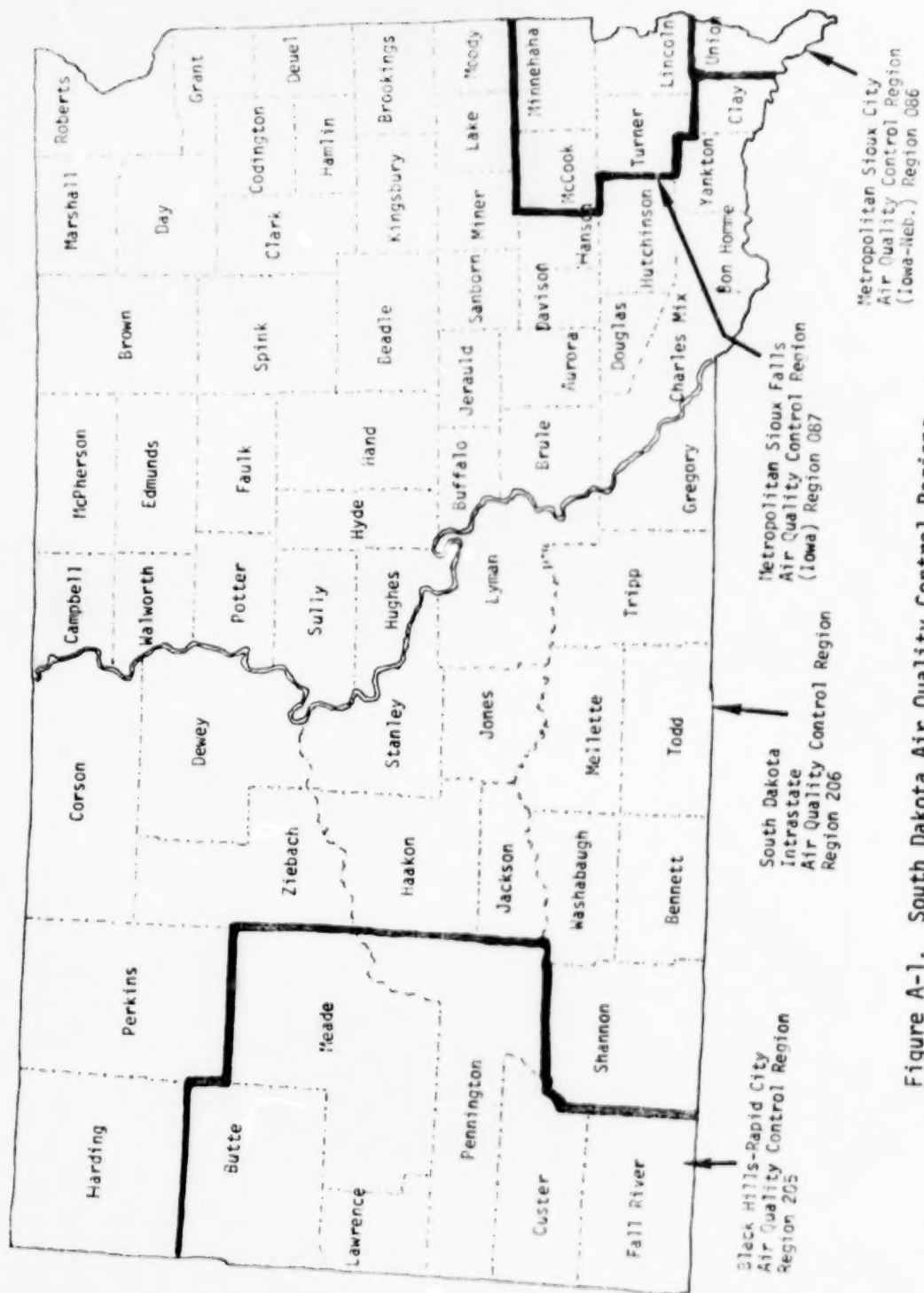


Figure A-1. South Dakota Air Quality Control Regions

Table A-2. South Dakota Attainment Dates

AQCR #	Name	Particulates Attainment Dates		Sulfur Dioxide Attainment Dates		Nitrogen Oxides Attainment Dates
		Primary	Secondary	Primary	Secondary	
086	Metro Sioux City	a	a	a	a	a
087	Metro Sioux Falls	a	7/75	a	a	a
205	Black Hills - Rapid City	a	a	a	a	a
206	South Dakota	a	a	a	a	a

a Ambient air quality below NAAQS when SIP was submitted.

Table A-3. Ambient Air Quality Standards South Dakota Expressed as $\mu\text{g}/\text{m}^3$

	Total Suspended Particulate		Sulfur Oxides		Nitrogen Dioxide
	Annual	24 hr.	Annual	24 hr.	Annual
Federal ¹ (Nov. 1972)	Primary	75(G)	260 ^a	80(A)	365 ^a
	Secondary	60(G)	150 ^a	---	---
State		60(G)	150 ^a	60(A)	260 ^a
					100(A)
					100(A)
					250 ^a

¹ Federal regulations apply
(G) Geometric mean
(A) Arithmetic mean

^a Not to be exceeded more than once per year

Table A-4. South Dakota AQCR Air Quality Status (1973), TSP^a

AQCR Name	AQCR #	Stations Reporting	TSP Concentration (µg/m ³)		Stations Exceeding Ambient Air Quality Standards				Reduction Required to Meet Standards	Standard on which Reduction is Based
			Highest Annual	Highest Reading 24-hr	Highest Reading 24-hr	Primary Annual	Secondary Annual	24-hr		
Metro Sioux City	066	2	90	496	219	1	1	1	31	24-hr
South Dakota portion		0	--	---	---	--	--	--	--	Secondary Standard
Metro Sioux Falls	087	5	75	370	179	1	2	1	16	
South Dakota portion		4	75	370	179	1	2	1	16	
Black Hills - Rapid City	205	3	129	542	376	1	1	2	60	
South Dakota	206	2	55	155	153	0	0	0	2	

^a 1973 air quality in National Air Data Bank as of July 28, 1974

^b Interstate

Violations based on more than one reading in excess of standards

Formula: $\frac{2nd\ highest\ 24-hr\ -\ secondary\ 24-hr\ standard}{2nd\ highest\ 24-hr} \times 100$

Table A-5. South Dakota AQCR Air Quality Status, 1973 SO₂^a

AQCR Name	AQCR #	# Stations Reporting 24-Hr (Bubbler)	# Stations Reporting (Contin.)	SO ₂ Concentration (µg/m ³)			# Stations Exceeding Primary 24-Hr	# Stations Exceeding Secondary 3-Hr	% Reduction Required To Meet Standards	Standard on Which % Reduction Is Based
				Highest Annual Reading	24-Hr	2nd Highest Reading 24-Hr				
Metro Sioux City ^b South Dakota portion	086	1	0	NDA	2	2	0	0	presently meets standards	
Metro Sioux Falls ^b South Dakota portion	087	1	0	NDA	2	2	0	0	presently meets standards	
Black Hills - Rapid City	205	1	0	NDA	10	10	0	0	presently meets standards	
South Dakota	206	0	0	NDA	0	0	0	0	0	

^a1973 air quality in National Air Data Bank as of July 28, 1974

^bInterstate

^cViolations based on more than one reading in excess of standards

^dFormula: $\frac{2nd\ highest\ 24-hr - Primary\ 24-hr\ standard}{2nd\ highest\ 24-hr} \times 100$

Table A-6. South Dakota Fuel Combustion Source Summary^a

<u>AQCR</u>	<u>AQCR #</u>	<u>South Dakota Power Plants</u>		<u>Other Fuel Combustion Point Sources</u>	
		<u>WEDSB</u>	<u>FPCC</u>	<u>Particulate</u>	<u>SO₂</u>
Metro Sioux City	086	0	0	0	0
Metro Sioux Falls	087	2	2	3	3
Black Hills -- Rapid City	205	2	1	2	3
South Dakota	206	5	0	5	5

^a Only sources in South Dakota are included

^b All sources from National Emission Data Bank listing as of November 1, 1974

^c Federal Power Commission information for 1973 of major power plants

Table A-7. South Dakota Emissions Summary, SO₂ (10³ tons/year)

AQCR	AQCR #	Total 10 ³ tons/ Year	Percent Fuel Combustion	Electricity Generation 10 ³ Tons/Year %	Point Source Fuel Combustion 10 ³ Tons/Year %	Area Source Fuel Combustion 10 ³ Tons/Year %
Metro Sioux City ^a South Dakota portion	086	14.7 .1	95 46	13.2 0	0.07 0	0.70 .05
Metro Sioux Falls ^a South Dakota Portion	087	4.2 4.0	81 90	2.3 2.3	0.34 0.66	0.78 0.67
Black Hills -- Rapid City	205	6.4	32	1.3	0.44	0.30
South Dakota	206	8.5	80	0.76	0.84	5.2
						4.8 46 18.6 16.7 4.7 61.2

^a Interstate emissions based on total of all counties in all states.

Table A-8. South Dakota Emissions Summary, Particulates (10³ tons/year)

AQCR	Total 10 ³ Tons/Year	Percent Fuel Combustion	Electricity Generation		Point Source Fuel Combustion		Area Source Fuel Combustion	
			10 ³ Tons/Year	%	10 ³ Tons/Year	%	10 ³ Tons/Year	%
Metro Sioux City ^a 086 South Dakota portion	7.2 .55	7 4.5	0.15 0	2.1 0	0.01 0	.14 0	0.37 .03	5.1 4.5
Metro Sioux Falls ^a 087 South Dakota portion	7.5 7.2	21 10	0.46 0.46	6.1 6.3	0.90 .11	12.0 1.5	0.22 .18	2.9 2.5
Black Hills - Rapid City 205	15.8	18	2.2	13.9	0.40	2.5	0.18	1.1
South Dakota 206	26.0	7	0.47	1.8	0.05	0.19	1.2	4.6

Interstate emissions based on total of all counties in all states

Table A-9. South Dakota Required Emission Reductions, Particulates

SIP		1975					1973 Data				
AQCR	AQ ^a Meas.	Emissions (10 ³ tons)	Allowable Emissions (10 ³ tons)	Estimated Emissions After Controls (10 ³ tons)	AQ ^a % Red.	Meas.	AQ ^a % Red.	NEDS Emissions (10 ³ tons)	Allowable Emissions (10 ³ tons)	Emission Tolerance (10 ³ tons)	
Sioux City ^b 086	c	.60	--	--	-	90	21	0.55	0.44	0	
Sioux Falls ^b 087	64	9.7	9.6 ^d	2.1	8.7	75	25	7.2	5.4	0	
Black Hills - Rapid City 205	18 increase	23.4	5452	--		129	49	15.8	8.1	0	
South Dakota 206	c	23.9	--	--	-	56	+	50	26.0	26.0	

^a Background of 18 $\mu\text{g}/\text{m}^3$ used in SIP, repeated for continuity

^b South Dakota portion of interstate

^c No data available

^d Not calculated in SIP, presented for comparison

Table A-10. South Dakota Required Emission Reductions, SO₂

SIP		1973 Data			
AQCR	AQ Measurement Control Value	Emissions (103 tons)	Allowable Emissions (103 tons)	1975 Estimated Emissions After Controls (103 tons)	
Sioux City ^a 086	b	.17	--	c	
Sioux Falls ^a 087	b	4.0b	--	c	
Black Hills Rapid City 205	6	2.7	243	c	
South Dakota 206	b	7.3	--	c	
		duction quired sed On AQ Data	NEDS Emissions (103 tons)	Allowable Emissions (103 tons)	Emission Tolerance (103 tons)
		ease	.1	1.82	1.72
		increase	4.0	72.6	68.6
		increase	6.4	22.7	16.3
		ND	8.5	NC	--

^a South Dakota portion of interstate

^b No data available

^c Controls not required per SIP

Table A-11. South Dakota Fuel Combustion Regulations
(applicable to new existing or modified sources)

Particulate	Sulfur dioxide	Nitrogen oxides
Shall not exceed 0.30 pounds per million Btu of heat input	Shall not exceed 3.0 pounds of sulfur dioxide per million Btu of heat input	Gas-fired equipment: Shall not exceed 0.2 pounds per million Btu of heat input Oil-fired equipment: Shall not exceed 0.3 pounds per million Btu of heat input

APPENDIX B

Tables B-1 and B-2 are the assessment of AQCRs which should be examined for the fuel switching impact on particulate and SO_2 emissions. They also provides an identification of those AQCRs which show little potential for fuel revision or regulation relaxation if ambient air standards are to be attained.

Those AQCRs designated "high" or "medium" here will be examined in later appendices where an attempt will be made to estimate the emissions resulting from an assumed fuel schedule different from the present, or the emissions which might result if all fuel burning sources emitted up to their "allowables."

The criteria for candidates are (1) the severity and breadth of air quality violations, (2) the tolerance for emissions increased in the AQCR, (3) the fraction of total emissions resulting from fuel combustion, and (4) AQMA designations. It should be noted that an AQCR may not necessarily need relaxation of regulations in order to accomplish fuel switching. Further, a good candidate in Tables B-1 and B-2 may later show little potential for fuel switching after individual sources are examined. Finally it is possible that an AQCR may have air quality levels below standard at present and may require more strict regulations than currently exist if all fuel burning sources were converted to dirtier fuels, i.e., "average" emission rate now may be below "average" regulations.

Table B-1. Candidacy Assessment for Relaxation of TSP Regulations

AQCR	Air Quality		Expected Attainment Date	Any Counties AQA Designations?	% Emission from Fuel Combustion	Tolerance for Emissions Increase (10 ³ tons)	Overall Regional Evaluation
	# Monitors	# Violations					
Sioux City ^b 086	2	2	(a)	0	4.5	0	none
Sioux Falls ^b 087	5	3	(7/75)	1	10	0	none
Black Hills Rapid City 205	3	2	(a)	0	18	0	none
South Dakota 206	2	1	(a)	0	7	26.0	medium

^aAir quality below standards

^bInterstate - South Dakota portion only

Table B-2. Candidacy Assessment for Relaxation of SO₂ Regulations

AQCR	Air Quality		Expected Attainment Date	Any Counties AQIA Designations?	% Emission from Fuel Combustion	Tolerance for Emissions Increase (10 ³ tons)	Overall Regional Evaluation
	# Monitors	# Violations					
Sioux ^a City ^b 086	1	0	(a)	0	46	1.72	medium
Sioux ^b Falls 087	1	0	(a)	0	90	68.6	high
Black Hills Rapid City 205	1	0	(a)	0	32	22.7	high
South Dakota 206	0	0	(a)	0	80	NC ^c	--

^aAir quality below standards

^bInterstate - South Dakota portion only

^cNot calculatable

APPENDIX C

This section is a review of individual power plants by AQCR. The intent is to illustrate fuel switching possibilities and particulate and SO₂ emissions resulting from these switches on an individual plant basis. The total AQCR emissions resulting from such switches is then calculated.

Current power plant information used to prepare Table C-1 were obtained from three main sources: (1) Federal Power Commission computerized listings of power plants and their associated fuel use, (2) the National Coal Association "Steam Tables" listing of power plants and fuel use in 1972, and (3) NEDS Emission data.¹ For those plants listed by the FPC (1 above), the 1973 fuel schedule was assumed, otherwise, fuel use is for 1972. Heat inputs are those based on actual fuel values where known, and average values shown in Table C-4 were used where not known. SO₂ and particulates emissions are those associated with the fuel use shown. In the case of particulates, emissions were calculated using NEDS emissions factors applied to the listed fuel schedule (in both tonnage and lbs/10⁶ Btu). When a plant was not listed in NEDS, AP 42 emission factors were used to estimate SO₂ and TSP emissions (see Table C-4).

¹NEDS Data Bank 1974

Table C-1A. South Dakota Power Plant Evaluation

AQCR/Number/County	Plant/ Fuel Design/ ^a Capacity	Type	Fuel		Heat Input 10 ⁶ Btu H	Emissions		Tons/yr	
			Amount 10 ³ ton/yr			SO ₂		Exist	Allow
Sioux Falls 087	Lawrence #1 C/G	Coal	14.5		21	578		80	
		2.1% S							
		9.2% A							
Minnehaha	48 MW	Gas	331 MCF		1005	<1		<1	
	Lawrence #2	Coal	14.5		21	578		52	917 ^b
		2.1% S							
		9.2% A							
	Lawrence #3	Gas	331 MCF		1005	<1		<1	
Sioux Falls 087	Pathfinder #1 O/G 75 MW	Coal	23.4		21	936		275	
		2.1% S							
		9.2% A							
Minnehaha	Pathfinder #2	Gas	536 MCF		1005	<1		<1	
	Pathfinder #3	Oil	3500000 gal		143/1000 gal	55		14	
		0.2% S							
		0% A							
	Pathfinder #2	Oil	333 MCF		1006	<1		2	
		0.2% S							
		0% A							
	Pathfinder #3	Gas	3500000 gal		143/1000 gal	55		14	
		0.2% S							
		0% A							
	Pathfinder #3	Oil	333 MCF		1006	<1		2	
		0.2% S							
		0% A							

^aFuel Design C=Coal; G=Gas; O=Oil

^bEmissions are for total plant

^cSouth Dakota does not have emission limits for liquid and gas fuel burning installations.

Table C-1B. South Dakota Power Plant Evaluation

AQCR/Number/County	Plant/ Fuel Design/a Capacity	Fuel		Emissions		Tons/yr
		Type	Amount 10 ³ ton/yr	Heat Input 10 ⁶ Btu H	SO ₂ Exist Allow	
Black Hills-Rapid City 205 Pennington	Ben French C/O/G 22 MW	Coal 0.37%S 5.2%A	87.2	16	613 3560	725 356
Black Hills-Rapid City 205 Lawrence	Kirk #1 C 31.5	Coal 0.37%S 5.2%A	5.67	16	40	74
	Kirk #2	Coal 0.37%S 5.2%A	9.95	16	70	129
	Kirk #3	Coal 0.37%S 5.2%A	12.3	16	87	160
	Kirk #4	Coal 0.37%S 5.2%A	67.0	16	471	1080
South Dakota 206 Walworth	Mobridge #1 C 8.5 MW	Coal 1.14%S 7.1%A	12.5	12	271	185
	Mobridge #2	Coal 1.14%S 7.1%A	12.5	12	271	185

^aFuel Design C=Coal; G=Gas; O=Oil^bEmissions are for total plant

Table C-1C. South Dakota Power Plant Evaluation

AQCR/Number/County	Plant/ Fuel Design/ ^a Capacity	Fuel		Emissions		Tons/yr	
		Type	Amount 10 ³ ton/yr	Heat Input 10 ⁶ Btu H	SO ₂ Exist	SO ₂ Allow	TSP Exist
South Dakota 206 Brown	Aberdeen #1 C/G 12.5	Coal 0.43%S 4.9%A Gas	.61 21 MCF	19 1000	5 <1	3530 ^b	1 <1
		Coal 0.43%S 4.9%A Gas	3.86 149 MCF	19 1000	32 <1		3 <1
	Aberdeen #2	Coal 0.43%S 4.9%A Gas	3.86 149 MCF	19 1000	32 <1	3530 ^b	3 <1
		Coal 0.43%S 4.9%A Gas	3.86 149 MCF	19 1000	32 <1		3 <1
	Aberdeen #3	Coal 0.43%S 4.9%A Gas	3.86 149 MCF	19 1000	32 <1	3530 ^b	3 <1
		Coal 0.43%S 4.9%A Gas	3.86 149 MCF	19 1000	32 <1		3 <1
	Aberdeen #4 reciprocating internal com- bustion	Diesel Oil 0.5%S 0%A	7000gal	140/1000gal	<1	--	<1
		Diesel Oil 0.5%S 0%A	7000gal	140/1000gal	<1	--	<1
	Mitchell #1 C/G 12.5	Coal 0.43%S 4.9%A Gas	2.34 16 MCF	19 998	19 --	3290 ^b	29 <1
		Coal 0.43%S 4.9%A Gas	8.38 199 MCF	19 998	70 --		24 <1
South Dakota 206 Davidson	Mitchell #2	Coal 0.43%S 4.9%A Gas	8.38 199 MCF	19 998	70 --	3290 ^b	24 <1
	Mitchell #3	Coal 0.43%S 4.9%A Gas	8.38 199 MCF	19 998	70 --		24 <1
South Dakota 206 Davidson	Mitchell #4	Coal 0.43%S 4.9%A Gas	8.38 199 MCF	19 998	70 --	3290 ^b	24 <1
	Mitchell #5	Coal 0.43%S 4.9%A Gas	8.38 199 MCF	19 998	70 --		24 <1

Fuel Design C=Coal; G=Gas; O=Oil
Emissions for total plant

Table C-1D. South Dakota Power Plant Evaluation

AQCR/Number/County	Plant/ Fuel Design/ ^a Capacity	Type	Fuel		Heat Input 10 ⁶ Btu H	Emissions		Tons/yr	
			Amount 10 ³ ton/yr			SO ₂		TSP	
South Dakota 206 Beadle	Huron Turbine	Oil 0.5%S 0%A Gas	997000gal 168MCF		140/1000gal 1050	Exist 7	Allow 473	Exist 8	Allow b
South Dakota 206 Yankton	Yankton #1 reciprocating internal com- bustion	Oil 0.5%S 0%A	32000gal		140/1000gal	<1	-	<1	-
	Yankton #2 reciprocating internal com- bustion	Gas	16 MCF		1050	-	-	-	-
		Oil 0.5%S 0%A	4000gal		140/1000gal	<1	-	<1	-
	Yankton #3 reciprocating internal com- bustion	Oil 0.5%S 0%A	66000gal		140/1000gal	<1	-	<1	-
	Yankton #5 reciprocating internal com- bustion	Gas	4 MCF		1050	-	-	-	-
		Oil 0.5%S 0%A	211000gal		140/1000gal	3	-	.1	-
		Gas	47 MCF		1050	-	-	-	-

^aFuel Design C=Coal; G=Gas; O=Oil^bSouth Dakota does not have emission limits for liquid and gas fuel burning installations.

Table C-2. Power Plant Projected Development

<u>AQCR</u>	<u>Owner</u>	<u>Plant</u>	<u>MW</u>	Estimated Emissions NSPS		
				<u>TSP</u> <u>Tons/Year</u>	<u>SO₂</u> <u>Tons/Year</u>	<u>NO_x</u> <u>Tons/Year</u>
South Dakota 206 Grant	Otter Tail Power Company	Big Stone #1 ^{a,b}	430	1522	18283	10664

^aCoal fired power plant

^bScheduled to go on-line in 1975

Table C-3. AP-42 Power Generation Emission Factors

Fuel	Particulates Lbs/Ton Lbs/10 ⁶ Btu	SO ₂ Lbs/Ton Lbs/10 ⁶ Btu	Hydrocarbons ⁶ Lbs/Ton Lbs/10 ⁶ Btu	NO _x (as NO ₂) Lbs/Ton Lbs/10 ⁶ Btu
Coal (1) (Bit.)				
General	160	7.4	0.3	0.013
Metbottom 10% A	130	7.0		
Cyclone	20	0.9		
1% S	Same	Same	0.3	0.13
2% S	as	as		
3% S	Above	Above		
Oil (2)				
0.5% S	8	0.058	Lb/10 ³ Gal	Lb/10 ³ Gal
1.0% S	8	.058	79	105
2.0% S	8	.058	157	105
			314	105
Gas (3)				
(.3 lbs S/ 10 ⁶ Ft ³)	15	.015	Lb/10 ⁶ Ft ³	Lb/10 ⁶ Ft ³
			0.57	600
			.00057	0.60

(1) Coal 23 x 10⁶ Btu/Ton

(2) Oil 140 x 10³ Btu/Gal

(3) Gas 1000 Btu/Ft³

APPENDIX D

The Tables D-1 in this appendix list individual industrial/commercial/institutional sources of particulates and SO₂ emissions which might show fuel switching potential. The sources are from a NEDS rank order emissions listing. At the top of Tables D-1 is the percent of total emissions (both fuel and non-fuel sources) accounted for in the AQCR, since not all sources could be listed in this report. It should be cautioned that the percent emissions accounted for is different than the "% of fuel use accounted for." It is possible that several potential fuel switch sources could be overlooked by the cutoff point on the emissions (i.e., a reasonable sized natural gas used may emit below our cutoff point in the NEDS rank order list).

Table D-1A. Major Industrial Fuel Combustion Sources with Multi-Fuel Capability

AQCR	County	Source	Boiler Capacity 10 ⁶ BTU/Hr	Fuel Type	Annual Amount	Emissions		
						1SP Tons/Year Exist. Allow.	SO ₂ Tons/Year Exist. Allow.	SO ₂ Tons/Year Exist. Allow.
Sioux Falls 087	Minnehaha	3	120	Oil 0.5% S 0% A Gas	8940000gal 45 MCF	67 <1	c c	317 <1
	Minnehaha	86	450	Oil 1.0% S 0% A Gas	365000gal 932 MCF	3 9	c c	26 <1
	Minnehaha	8b	NA ^b	Oil 1.7% S 0% A Gas	2390000gal 631 MCF	28 6	c c	319 <1
Black Hills-Rapid City 205	Custer	1	NA ^b	Wood	3900 tons	3	-	54
	Fall River	1	90	Coal 1.0% S 7.9% A	20000 tons	296	118	380
	Fall River	87	30	Coal 8.64% S 4.9% A	4940 tons	48	39	60
South Dakota 206	Beadle	86	92	Oil 0.88% S 0% A Gas	675000gal 180 MCF	8 2	c c	48 <1
	Brookings	86	NA ^b	Coal 2.9% S 6.8% A Gas	11500 tons 142 MCF	33 <1	- -	632 <1

^aEmissions for total plant

^bInformation not available

^cSouth Dakota does not have emission limits for liquid gas fuel burning installations.

Table D-1B. Major Industrial Fuel Combustion Sources with Multi-Fuel Capability

AQCR	County	Source	Boiler Capacity 10 ⁶ BTU/Hr	Fuel Type	Annual Amount	Emissions		
						TSP Tons/Year Exist. Allow.	SO ₂ Ton/Year Exist. Allow.	SO ₂ Ton/Year Exist. Allow.
South Dakota 206	Brookings	87	66	Oil 3.0% S 0% A Gas	250000gal	3	b	59
					30 MCF	<1	b	<1
	Clay	86 #1	50	Oil 0.7% S 0% A Gas	369000gal	3	b	18
					22 MCF	<1	b	<1
		86 #2	56	Oil 0.7% S 0% A Gas	414000gal	3	b	21
					25 MCF	<1	b	<1
		86 #3	56	Oil 0.7% S 0% A Gas	417000gal	3	b	21
					25 MCF	<1	b	<1
	Devel	72	54	Oil 0.7% S 0% A Gas	1210000gal	9	b	60
					1 MCF	<1	b	-
	Spink	86	34	Oil 1.0% S 0% A Gas	507000gal	4	b	36
					54 MCF	<1	b	<1
	Yankton	86	196	Oil 0% S 0% A Gas	11000gal	<1	b	-
					385 MCF	3	b	<1

^aEmissions for total plant^bSouth Dakota does not have emission limits for liquid gas fuel burning installations.

APPENDIX E

The state of South Dakota was found to have no area sources which could be evaluated within the context of Section 4 of ESECA.

APPENDIX F

Tables F-1 and F-2 in this appendix list individual power plants and industrial/commercial/institutional sources capable of fuel conversion.

Table F-1. Emissions Resulting from Fuel Switch for Power Plants with Dual Fuel Capability

AQCR Source	Present Emissions ^a		% Coal	% Gas	% Oil	% Full Oil/ Coal Utilization	Emissions after Fuel Switch		
	TSP	SO ₂					Emission Tons/Year	TSP Allow Tons/Year	SO ₂ Allow ^b Tons/Year
Sioux Lawrence Falls 087	407	2092	0.09	99.91	-	111111 (c)	452222 ^b	917	2324442 ^b 9170
Pathfinder	48	165	-	40	60	167 (o)	80	-	276 11400
South Aberdeen Dakota 206	7	69	0.05	99.95	-	200000 (c)	14000 ^b	353	136000 ^b 3530
Mitchell ^c	53	89	0.04 ^b	99.96	-		87519	376	30024 3290
Units 1 2 3 4			100 - 0.08 -	- 100 99.92 100	- - - -	(125000) (c)			

Evaluation: Only the Pathfinder Power Plant is a viable candidate for fuel switching. The plant currently uses both oil and natural gas for power generation, and has the design capacity to switch to all oil combustion.

The remaining plants would emit exorbitant levels of both TSP and SO₂, many times over the allowable levels for each facility as specified by South Dakota State Regulations.

^aBased on total emissions from power plant
^bPlant capable of full switch, assumes same type of coal
^cUnits 2, 4 all gas, Unit 1 all coal, Unit 3 coal and gas - candidate for switching
 Available for fuel switching

(c) = Coal
 (o) = Oil

Table F-2. Emissions Resulting from Fuel Switch for Major Industrial Sources with Dual Fuel Capability

AQCR	Source	Present Emissions ^a		% Coal	% Gas	% Oil	% Full Oil/ Coal Utilization	Emissions after Fuel Switch	
		TSP	SO ₂					TSP Emission Tons/Year	SO ₂ Allow ^b Emission Tons/Year
Stouff Falls 067	Minnehaha #3	67	317	-	3.5	96.5	103 (o)	69	4720
	Minnehaha #86	12	26	-	94.8	5.2	1923 (o)	231	5900
	Minnehaha #88	34	319	-	64.9	35.1	285 (o)	97	-
South Lakota 206	Beadle #66	10	48	-	63.5	36.5	273 (o)	27	1210
	Brookings #86	33	632	NC ^b	NC ^b	-	NC ^b	NC ^b	-
	Brookings #87	3	59	-	44	56	179 (o)	5.4	865
	Clay #86	9	60	-	30.3	69.7	143 (o)	13	734
	Devel #72	<1	36	-	0.6	99.4	101 (o)	9.1	-
	Yankton #85	3	<1	-	43	57	175 (o)	1	445
				-	99.6	0.4	25000 ^c (o)	750	2570

Evaluation: Based on available data, existing SO₂ emission regulations are adequate, and would allow fuel switching.

^aBased on total emissions from plant
not calculatable.

^bDesign rate unknown - plant may not be fully able to switch
South Dakota does not have emission limits for liquid and gas fuel burning installations.

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